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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/537,396	04/07/2006	Markus Gabriel	1304.067USU	8481

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EXAMINER

MENZ, LAURA MARY

ART UNIT	PAPER NUMBER
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2813

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/537,396	Applicant(s) GABRIEL ET AL.	
	Examiner Laura M. Menz	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24, 26-35 and 37 is/are pending in the application.
- 4a) Of the above claim(s) 23, 24 and 26-35 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-22 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/2/05</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Election/Restrictions

Claims 23-24, 26-35 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected claims, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 2/5/09.

Applicant's election with traverse of claims 1-22 in the reply filed on 2/5/09 is acknowledged. The traversal is on the ground(s) that claim 23 has been amended to depend from claim 1 and has been further amended to be a process claim and no longer a device claim- thus rendering the restriction requirement moot. However this is not found persuasive because claims 23-35 constitute a separate and distinct species from that of elected claims 1-22, claims 1-22 pertain to a method including a wet chemical cleaning process; Claims 23-35 pertain to a method including generating a plasma by supports and counter electrodes. Applicant should note that should claim 1 be placed in condition for allowance, claims 23-35 may be rejoined and allowed.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an

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international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-9, 12, 14-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Uner et al ('833).

Uner et al teaches the following claimed limitations as cited below:

1. (Original) A process for connecting at least two substrates (I, I') by means of bonding after pretreating at least one of the bonding surfaces, characterized in that for the pretreatment a plasma (2) is acting on the bonding surface under atmospheric pressure (Col.5-6, lines: 65-10).

2. (Original) The process according to claim 1, wherein the plasma (2) is generated by corona discharge (8) (Col.6, lines: 55-65).

3. (Previously presented) The process according to claim 1, wherein the bonding surface is cleaned by the plasma (2) (Col.6, lines: 1-10).

4. (Previously presented) The process according to claim 1, wherein the bonding surface (1a) is chemically activated by the plasma (2) (Col.6, lines: 55-65).

5. (Previously presented) The process according to claim 1, wherein a layer of the bonding surface (1a) is removed by the plasma (2) (Col.6, lines: 1-10).

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6. (Previously presented) The process according to claim 1, wherein a layer is grown on the bonding surface (1a) by the plasma (2) (Col.3, lines: 45-50).

7. (Previously presented) The process according to claim 1, wherein the substrates (1, 1') are connected directly during bonding (Col.8-9, lines: 65-15).

8. (Previously presented) The process according to claim 1, wherein the substrates (1, 1') are connected via metal layers covering the substrates fully or partly (Col.6, lines: 25-35).

9. (Original) The process according to claim 8, wherein the metal layers consist of copper (Col.6, lines: 25-35).

12. (Currently amended) The process according to claim 1, wherein the plasma treatment takes place as the last step before bonding (Col.8-9, lines: 65-15).

14. (Previously presented) The process according to claim 1, wherein the plasma (2) is generated by using O₂ gas or O₃ gas or inert gases (Col.6, lines: 45-55).

15. (Original) The process according to claim 14, wherein the plasma (2) is generated by using N₂ gas (Col.6, lines: 45-55).

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16. (Previously presented) The process according to claim 1, wherein O_2 , NH_3 , forming gas or HCL or a mixture of said gases is used as the process gas (Col.6, lines: 45-55).

17. (Previously presented) The process according to claim 1, wherein the plasma (2) is passed across the bonding surface (1a) of the substrate (1, 1') (Col.9, lines: 1-5).

18. (Previously presented) The process according to claim 1, wherein the bonding surface (1a) of the substrate (1, 1') is moved through the plasma (2) (Col.8-9, lines: 65-15).

19. (Previously presented) The process according to claim 1, wherein the plasma (2) and the bonding surface (1a) of the substrate (1,1') are moved relative to each other (Col.8-9, lines: 65-15).

20. (Previously presented) The process according to claim 17, wherein the plasma (2) is passed across the bonding surface (1a) in only one scan (Col.9, lines: 1-7).

21. (Previously presented) The process according to claim 1, wherein the plasma (2) acts simultaneously on the bonding surfaces (1a) of a plurality of substrates (1, 1') (Col.8, lines: 45-55).

22. (Previously presented) The process according to claim 1, for the pretreatment in the bonding of semiconductor substrates or in SOI bonding (Col.6, lines: 1-5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-11, 13 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uner et al ('833) as applied to claim 1 above, and further in view of Jung et al ('816).

Uner teaches the limitations as cited above, however fails to teach the limitations of claims 10-11, 13, and 37 which require performing a wet treatment prior to the plasma treatment (11 and 37); after the plasma treatment (10) and performing both the wet and plasma treatment multiple times (13).

However, Jung teaches that using wet treatments to clean circuit patterns is common (0007).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Uner's process to further include a wet cleaning step either before or after and in repetition with the plasma treatment because as Jung teaches wet cleaning steps are commonly used to remove contaminants on substrate surfaces[0007] which is ultimately the purpose behind the plasma treatment taught by Uner which is to remove contaminants of the

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substrate surface prior to bonding. Therefore to use both treatment to remove contaminants is obvious and performing the steps sequentially is required since water cannot be present during plasma treatment (see Uner), therefore such steps must be carried out sequentially but not simultaneously.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Menz whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Landau can be reached on (571) 272-1731. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Laura M Menz/
Primary Examiner, Art Unit 2813

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